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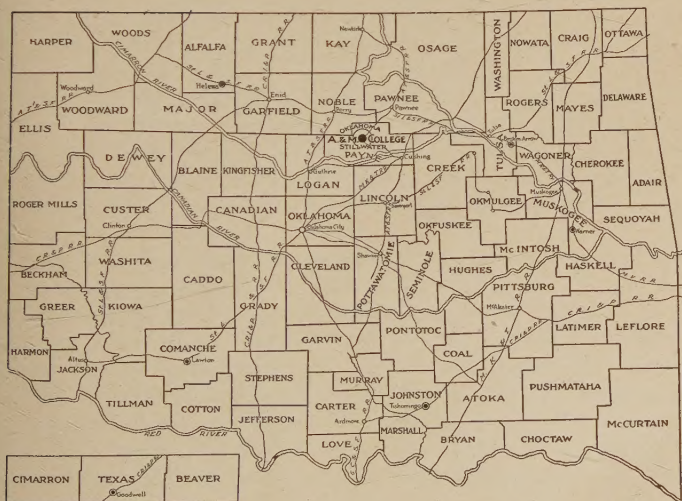


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SEEDING WHEAT IN OKLAHOMA

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LOCATION OF THE A. & M. COLLEGE AND THE SIX SCHOOLS OF AGRICULTURE

STILLWATER, OKLAHOMA

SEEDING WHEAT IN OKLAHOMA

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The Seedbed Should Be Prepared Early

In order to determine the best time to prepare land for wheat, an experiment on time of plowing was conducted a few years ago on the Station farm. A five-year test was made in which early, medium and late plowings were compared. July plowing gave an average yield of 27.1 bushels per acre; August plowing yielded an average of 24.2 bushels per acre. The middle of September plowing resulted in an average of 22 bushels per acre.

A field which is continuously devoted to wheat should be stirred as quickly as possible after the crop has been harvested. It is not always possible to plow or otherwise stir wheat stubble land early, for the soil is so hard that little progress can be made. In such cases the only alternative is to double disk and await the necessary rainfall to finish the preparation of the seedbed. The early disking will greatly assist in the later preparation. The advantage of preparing stubble land early is due almost entirely to the saving of moisture. Prepared soil is in a condition to receive and use to the best advantage whatever precipitation may occur before the seeding is done. In those seasons when considerable rain falls during August and after the soil is prepared, crabgrass and other grasses and weeds will spring up in abundance. Such growth must be kept in check by disking. If this is not done in time, early plowing will be of little or no value.

If wheat is to follow corn or cotton, or any other intertilled crop, such as kafir and cowpeas, the time of preparing the soil will depend upon the time when the preceding crop can be harvested. The soil in such cases should be prepared just as soon as possible without interfering with the preceding crop. Where the intertilled crop is late, the wheat may be drilled between the rows with a one-horse drill. If the area is to be stirred, listed or otherwise dealt with before being seeded, such operations should be performed not later than the first of September. Disking may be done immediately before the seeding.

The Best Methods of Preparing the Seedbed

The following methods are given in the order of preference:

1. Plowing with a stubble plow.

2. Listing, followed with "middle-busting", usually called double listing.

3. Listing, followed with sledding or cultivating in order to level down the ridges.

While the first method is the best so far as yield is concerned, it is often less profitable than the more rapid methods. Where a wheat farmer grows several hundred acres it is often impossible to get such a large area plowed in time to make a desirable seedbed. This is due to the fact that in the wheat sections of Oklahoma plowing must be done when the moisture conditions will permit, and must be done rapidly, if the seedbed is to be prepared when it should be. In order to overcome the difficulty of preparing the seedbed as a result of the rapid drying out of the soil a sufficient number of teams to perform the work quickly should be provided. Listing the ground is a much more rapid method than plowing. The ridges should be properly worked down by splitting the middles or by using the disk sled or common cultivator. The loss in production resulting from listing as compared with plowing is so small that often more is gained in time than is lost in yield. It is better to have the stubble listed early than to have it plowed late. The suitability of the several methods depend upon the type of soil. In loose, sandy and sandy loam soils, plowing has practically no advantage over listing. In the clay or tight types of soils there is a bigger difference in favor of plowing.

Where wheat follows an intertilled crop the preparation of the soil will depend upon the treatment which the previous crop has received. If it has received good treatment and the soil is reasonably loose the wheat can be drilled between the rows of the intertilled crop. After the cultivated crop is harvested the stalks should be cut with a stalk cutter. Where the crop is removed sufficiently early, as is sometimes the case with the grain sorghums, corn and cowpeas, the stalks, if left on the ground, should be cut with a stalk cutter and the soil thoroughly double disked. In such cases it is usually so late that plowing or listing is out of the question. In case the soil is hard and in poor physical condition, it might be advisable to give more careful preparation, provided there was sufficient time to permit of working the seedbed down in good shape.

Plowing Deep for Wheat

A four-year test was conducted on the Experiment Station farm to determine the best depth to plow for wheat. The plots were prepared in duplicates as follows: 1, Disked only; 2, plowed to a depth of three inches; 3, plowed to a depth of four inches; 4, plowed to a depth of five inches; 5, plowed to a depth of six inches; 6, plowed to a depth of seven inches; 7, plowed to a depth of eight inches; 8, plowed to a depth of nine inches. The plowing was done each season on all plots about the first of August. Aside from plowing, the plots received the same cultural treatment. The lowest yield, which

was ten bushels per acre, was obtained from the disked plots, and the highest yield, which was sixteen bushels per acre, was obtained from the seven-inch plots. There was practically no difference between the seven, eight and nine-inch plowing. This experiment was conducted on upland clay soils, and the results should be interpreted to apply to such types of soils. These results indicate that plowing for wheat should be reasonably deep, but there is a limit to the depth to which plowing can be profitably done.

Loose sandy soils, especially those which blow badly, should be stirred only deep enough to turn under the crop residue. It is important to remember in this connection, where it is desired to increase the depth of the seedbed by deep plowing, that the increase should not be made in one season, but should be gradually increased each season until the desired depth is attained.

Sandy Soils Are Difficult to Handle

Where wheat is grown in sandy regions it is necessary to exercise a great deal of care to prevent the soil from blowing. If the soil can be prevented from starting to blow it will be much easier handled than if it has once been severely affected by blowing.

Sandy or blowy soil is better prepared by listing. The listing should be done east and west in Oklahoma. The ridges should not be entirely leveled down, as the surface should be left rough. Deep listing is not advisable. In the winter and spring the hills or knolls most likely to be affected should be given a good coating of straw. Where such soil is left uncropped for any length of time during the blowing season it is better to leave crop residue or weeds and grass unremoved or not plowed under than to leave the surface bare. A little vegetable matter will greatly check the effect of wind on such soil.

Continuous Growing and Fertilizing Wheat

In 1892 an acre of land was set aside for the continuous culture of wheat. This area was grown continuously to wheat without any fertilizer being added until 1898. In that year the tract was divided into two plots of one-half acre each. The plan called for Plot 1 to receive fifteen tons of well rotted manure; Plot 2 was to receive no manure or other fertilizer. The experiment has now been conducted for twenty-one years. The results of yields are complete to date except for the season of 1895. No records are available for that year. So far as the records show, manure has been applied but three times since the experiment was begun. The first application of fifteen tons was made in 1899. The second was probably made in 1903, and the last was made in February, 1913.

The cultural notes are not complete, but the wheat has been seeded each fall from the 15th of September to the 15th of October.

The plowing has been done in July. No definite variety has been grown on these plots, but in no season have different varieties been used on the two plots. Fultz, Sibley's New Golden and Karkof are the varieties which have been grown.

The yields obtained from 1893 to 1903, inclusive, are given in the following table.

TABLE I

Showing yields before this acre tract was divided and before any manure was added to Plot 1:

Year.	Plot 1.	Plot 2.
1893	10.55	10.55
1894	20.90	20.90
1895		
1896	7.10	7.10
1897	17.80	17.80
1898	7.25	7.25
Total, five years.....	63.60	63.60
Average per year.....	12.72	12.72

TABLE II

Giving yields after the acre tract was divided into one-half acre plots, and after manure was added to Plot 1, computed on acre basis:

Year.	Plot 1. Manured.	Plot 2. Unmanured.
1899	30.60	12.00
1900	36.80	18.10
1901	32.20	28.00
1902	17.40	15.30
1903	27.60	20.30
1904	15.70	12.60
1905	11.48	4.63
1906	25.08	14.75
1907	14.93	5.20
1908	15.47	12.90
1909	22.70	10.83
1910	35.20	18.70
1911	4.86	2.28
1912	20.40	5.32
1913	14.80	5.60
Total 15 years.....	330.72	186.51
Average per year.....	22.05	12.43

TABLE III

Summary of manured and unmanured plots, computed on acre basis:

Plot 1 Manured.	Plot 2 Unma- nured.	Average Increase Per Year.	Number of Years Conducted.	Total Manure Applied Plot 1.	Average Tons Applied Per Year.	Increase Per Ton of Manure
22.05	12.43	9.62	15	45	3	3.21

The results of this experiment show that for fifteen years the manured plot has yielded an annual average of 9.62 bushels more per

acre than the unmanured. Manure has been applied at the rate of forty-five tons per acre for the entire fifteen years, or at the rate of three tons per acre each year. For each ton of manure applied there has been an increase of 3.21 bushels of wheat.

Manure should be applied on the growing wheat during the fall or winter. Frequent light applications are considered to be more valuable than heavy applications less frequently applied. An application of a few tons of manure per acre each year will in most cases keep up the production of wheat even on soils which are continuously cropped to wheat.

In the extreme western and northwestern counties care should be used in the quantity of manure applied at any one time, as in those sections decomposition takes place very slowly, and where heavy applications are made considerable injury may result.

Seeding Should Be Done Early

Wheat should be seeded in Oklahoma between September 15 and October 15. As a usual thing it should be nearer the 15th of September than the 15th of October. Seasons so greatly affect the production of crops that no definite time can be set for seeding. Considering the results of a great number of years, however, early seeding is advisable. Where the hessian fly does any considerable damage, late seeding should be practiced.

There Are Many Good Varieties of Wheat for Oklahoma

There is no one variety of wheat that is better than other varieties. More importance should be placed upon the source of the seed than upon the variety name. One might be able to obtain seed wheat of the Karkof variety from two different sources and find a greater difference in the yield of the two different strains than he would between the Karkof and other varieties of hard Russian wheat. In the wheat belt of Oklahoma, which includes the north-central and north-western counties, some hard, winter variety of the Turkey Red group should be grown. The Station has been recommending the Karkof for several years. Such varieties as the Turkey Red, Bulgarian and the Theiss have given good results. In the eastern and southeastern counties of the State, soft wheat can, perhaps, be grown to a better advantage than can the hard, winter varieties. Such varieties as Sibley's New Golden and Fultz are to be recommended for these sections. Hard wheat grown for several years in the central, eastern and southeastern portions of Oklahoma seems to deteriorate into a soft winter wheat. It is difficult to retain a variety of pure, hard wheat in such sections of the State. We are not recommending any beardless, hard, winter wheat for Oklahoma. No variety of spring wheat should be grown in this State.

It Will Pay to Grade Seed Wheat

In order to insure a regular stand of wheat and to eliminate any mixtures of rye and other undesirable seeds, wheat intended for seed should be graded.

How to Drill

In seeding wheat the grain drill should be used. The objections to broadcasting are so evident they need no discussion. There are several types of drills on the market. The kind to procure will depend a great deal on individual preference. The disk drills undoubtedly give better satisfaction than do the hoe drills. In the Station work we prefer a single disk drill.

Amount of Seed to Use per Acre

Plant from five to six pecks of good seed per acre. Good results have been obtained from a less amount. The rate of seeding should be decreased or increased according to the amount of rainfall. A lighter rate of seeding should be practiced in the western part of the State than in the eastern part.

Harrowing Wheat

When the soil is dry in the spring it is a good practice to run over the field of wheat once or twice, using a light harrow. The teeth should be set to slant backward slightly. On light soil a weeder will do good work. This should be done before the spring growth has advanced to any marked extent. If the stand is very thick, no damage will be done even if many plants are pulled up. On thin stands it will be well to run lengthwise of the drilled rows. This practice is recommended especially for the hard soils in the dryer parts of the State. Such work should not be performed when the soil is wet.